

A STUDY OF A BREEDING COLONY OF YELLOW-  
HEADED BLACKBIRDS; INCLUDING AN ACCOUNT  
OF THE DESTRUCTION OF THE ENTIRE  
PROGENY OF THE COLONY BY SOME  
UNKNOWN NATURAL AGENCY.<sup>1</sup>

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*Plates V-XVI.*

IN an effort to secure exact and detailed information in regard to the nidification of the Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*), a nesting colony of these birds was subjected by the writer and an assistant to a continuous daily inspection for a period of thirty-two days, from May 13 to June 13 inclusive, 1901. The locality selected was a clump of quill-reeds (*Phragmites phragmites*) about an acre in extent, isolated by open marsh from a more extensive growth of reeds bordering a large slough which forms part of the preserve of the Long Meadow Gun Club, lying in the bottom-land of the Minnesota River and distant ten miles from the city of Minneapolis, Minnesota. It was on the opposite side of the slough from the buildings of the Gun Club, accessible only by boat and in no way subject to intrusion by domesticated animals of any sort. Observations were begun on May 13, and from that date until June 13 the entire site was carefully examined once, and often twice, a day, with the exception of three days — May 16 and 28 and June 6 — when severe wind and rain storms made it impossible to reach the locality.<sup>2</sup> Each nest as it was found was marked by an inconspicuous numbered tag attached to the reeds

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<sup>1</sup> Read in part before the American Ornithologist's Union in Cambridge, Mass., Nov. 18, 1908.

<sup>2</sup> A large part of the data forming the basis of this paper was secured through the patient and careful coöperation of Miss Mabel Densmore of Red Wing, Minn., who was quartered at the Gun Club and made the daily rounds of the Colony in the absence of the writer.

near by and as much out of sight as possible. A note book was kept and the notes entered daily on the spot under each nest number. The water throughout the clump of reeds varied in depth from six to eighteen inches. It was thus necessary to wade in making the rounds of the nests, but it was possible to get about without disturbing the vegetation greatly, or making any considerable noise, so that the birds soon became accustomed to the daily visitations and, for the most part, seemed little annoyed by the intrusions.

The spring of 1901 was somewhat backward, the weather having been rough and cold. Meadowlarks, Red-winged Blackbirds and Vesper Sparrows had arrived by the latter part of April. The first Lark Finches came May 1, just as the last of the early blossoming Nuttall's Pasque-flower (*Pulsatilla hirsutissima*) were fading on the prairie knolls, and the first of the marsh marigolds (*Caltha palustris*) were coming into bloom in the marshes below. On May 3 the first Yellow-headed Blackbirds were seen, all males except one. The edges of the sloughs were then just beginning to show green with the sprouting grass and willows. The Baltimore Oriole and the Rose-breasted Grosbeak came May 4, and the first Warbling Vireo was heard on the 5th. May 12 it was still cold — so cold that winter clothing out-of-doors and fires indoors were necessary for comfort. A 'white frost' was to be seen that morning and thin ice was said to have formed, but vegetation did not suffer to any appreciable extent. Many birds had arrived but there had been no distinct bird 'wave' as usual, the cold weather having interfered with the regular order of migration. Most of the trees were in small leaf. Willows were in full bloom, many staminate catkins having scattered. Sweet-flag and iris were just coming up. The water of the marsh was full of tadpoles. Many Mud-hens and Florida Gallinules had arrived and were to be seen feeding like chickens out in the bare slough. All day long on this date a large flock of Yellow-heads, made up entirely of males, fed, first among the rice stubble near shore, and, later (in the afternoon), in the pasture in front of the house. They seemed to find food among the broken rice stalks and the short grass, just what could not be determined by watching them. As the males sat about in the grass it was difficult at times to distinguish their saffron heads from the dandelion blossoms which grew abundantly where they were feeding. Late in the afternoon of the 13th the writer paddled



YELLOW-HEADED BLACKBIRD STUDIES.

Upper figure, general view of the quill-reed 'clump' in early June. Male Yellow heads standing guard on the tops of the old dead reeds.

Lower figure, showing the Wild Rice six or eight inches high, and the old broken down stubble. Quill reeds (*Phragmites*) on the right.



across the slough and there in the quill-reeds found many Yellow-headed Blackbirds, and to his surprise discovered that the females were also present in full force and busily engaged in building nests. Some two dozen nests were found about a little pond separated a little way from the main slough. They were in all stages of construction, two or three being completed and nearly dry. A suitable territory for making the observations contained in this paper was selected and outlined so that as little confusion as possible would result in keeping tab on the nests. An area of quill-reeds, then almost free from nests, was chosen.

When, therefore, the work began on the afternoon of May 13, marsh vegetation was only just starting and very little new growth had sprung up among the old, dry, last year's reed stalks — only a green shoot here and there. Out in the slough the wild rice had not yet appeared above the surface of the water, the last year's dead stubble alone being visible. The first nests of the Yellow-heads are thus, of necessity, hung among the old reed stalks, only the later ones including new growth, but even in the latter the rigid last year's stems always form the chief support. Throughout Minnesota these quill-reed swamps or 'cane-brakes,' as they are often locally called, form the almost exclusive nesting sites of the Yellow-headed Blackbird. So true is this that the distribution of this bird, in the nesting season, is largely determined by the presence of this plant. In times of high water in May and June the Yellow-heads may be driven to nest elsewhere, selecting then various unusual sites. Under such conditions nests may be found built among bulrushes (*Scirpus*), and occasionally the birds are forced to build in the willows bordering the sloughs, after the manner of the Grackles and Red-wings. It is sometimes stated<sup>1</sup> in accounts of the nesting of this bird that it places its nest among wild rice (*Zizania aquatica*), but this is rendered impossible by the fact that the old rice stalks are weak and fall into the water in the autumn, leaving only a low broken stubble; while the new growth is usually only eight or ten inches high when the nesting season of the Yellow-head is over.<sup>2</sup> It is true, however, that in rare instances

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<sup>1</sup> J. W. Preston, *Oöologist*, Vol. I, July, 1884, p. 36. Bendire, *Life Hist. N. Amer. Birds*, 1895, p. 448 (quoting B. T. Gault).

<sup>2</sup> Attention was called to this matter and a full explanation given by Ludwig Kumlien of Milton College, Wis., in 'The Osprey,' Vol. I, May, 1897, p. 117.

stray nests are built among the low rice stubble, this bringing the bottom of the nest almost to the water-level, a precarious position, since a very little rise in the water in the slough would submerge such nests.

The first day that the reed-clump selected was examined only three nests were found, one about completed and two just begun. During the next two days — May 14 and 15 — twenty-eight (28) nests were tagged. Nest-building was then at its height and for some days thereafter intense activity was displayed. New nests were started almost daily until the end of May and one as late as June 2. These later nests were probably, as will appear further on, the work of unskillful birds that had failed in their earlier attempts. In all, sixty-two (62) nests, counting unfinished attempts as well as completed nests, were discovered, tagged, and subjected to daily scrutiny in this one clump of reeds. Leaving the recital of the detailed notes made during the thirty-two days to form an addendum to this paper, a general summary of the findings may here be presented as being of chief interest to the general reader. For a clear understanding of how some of the observations were obtained it should be stated that many hours were spent at various times throughout the month in quietly watching, glass in hand, the workings of the colony from a convenient distance.

It was never possible to tell just how many pairs of Yellow-heads composed this colony; but probably thirty pairs is not far from the correct number.

The females did all the work connected with the nest building, the males taking no part whatever.

The females incubated the eggs without any assistance from the males, except that occasionally the males brought food to their sitting mates.

While the nests were being built and the eggs incubated the males remained about the locality part of the time, perching on the reed tops and occasionally showing some interest and concern, especially if a hawk, bittern or other large bird appeared; but they were more often absent roving about the neighboring upland in little parties, foraging for food and amusing themselves. All the birds, females as well as males, seemed to leave the nesting place to feed and could be seen departing or returning in little straggling bands, this being especially noticeable morning and evening.



The males assisted the females to a rather limited extent in feeding the young. Observations in regard to the young were unfortunately rather curtailed in this study for reasons that will appear later. At other times the male bird has occasionally been seen feeding the young both in the nest and after they had left the nest and were perched about among the reed tops. Grasshoppers, various insects and a large black larva of some sort which the birds obtained from among the decayed vegetation in the shallow water along the edges of the slough formed the chief food supply. These larvæ were ugly and formidable objects and were thrust down the throats of the young birds with considerable difficulty. On one occasion a female was seen carrying a large flat object, squirming and curling about her bill, which was evidently a leech.

The nests were placed from two to three feet above the water. The body of the nest was invariably constructed of water soaked dead grass blades picked out of the water of the marsh. This sort of material being soft and pliable was easily woven and wound around the reed stems to the smooth surface of which it closely adhered; and when the structure, which was at first very wet, soggy and dark colored dried in the sun and wind, it contracted and drew the included reed stems nearer together thus forming a compact, firm, and securely attached basket-like nest. The lining consisted of pieces of broad, dry, reed leaves and the rim of the nest was well finished off with the fine branches of the plume-like fruiting tops of the reeds. Occasionally the lining was not placed for a day or two until the nest had dried somewhat, but usually the coarse lining was added, in part at least, to the bottom and around the walls while the body of the nest was still in course of construction and soft and wet. The finishing touches to the nest consisted in adding the fine material about the upper walls and rim which, in the more perfect nests, partially closed and formed a sort of canopy over the entrance. The details in the construction of the nest and the considerable variation in the finish and size of different nests are better shown in the accompanying illustrations than can be presented by written description.

Of the sixty-two nests, twenty-eight were abandoned before completion, being deserted in all stages of construction from the first few strands to almost finished nests. Careful examination

revealed the fact that in almost all, if not all cases, this was due to faulty workmanship or poor judgment in selecting a site. Either the material was not wet enough, making it impossible to handle it satisfactorily and not affording sufficient shrinkage, or it was not well placed, or the reeds forming the support were improperly situated so that as the nest dried it became distorted and unfit for use. In one instance, it was positively determined that the same bird built four imperfect nests before being able to construct one that was habitable. She was closely watched for hours and as she had chosen an open place in the edge of the clump it was easy to observe her movements. After nearly completing one of the faulty nests, this bird seemed suddenly to become aware that it was a failure and in the savage manner in which she tore out the inside and pulled to pieces the rim, displayed a degree of irritability and temper that would have done justice to the average human artisan under similar circumstances. To make matters worse, she began at once the erection of another domicile some fifteen feet away, using the nearly dry material pulled from the despoiled nest. This, of course, she found impossible and although she tried later to carry on the work with wet material this nest, also, was a failure.

A skillful, industrious bird would build one of these large beautifully woven and lined nests, all complete, in from two to four days. Of twenty well built nests, nine were finished in two days, nine in three days and two in four days. It never ceased to be a source of astonishment how these bulky, well made structures could spring up almost over night when it was considered that a single bird had not only to collect but skillfully manipulate all this large mass of material.

Thirty-six of the sixty-two nests begun were completed and received eggs. In only twenty-six of the thirty-six was the whole clutch laid. From one to five days was allowed to elapse after the completion of the nest before egg-laying began. The eggs were invariably deposited one each day. Of the twenty-six completed sets, there were two sets of three each, twenty-two sets of four each, and two sets of five each.<sup>1</sup> In one instance, a Cowbird's egg was

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<sup>1</sup> The writer in a large experience has never found a set of six eggs, although this number is sometimes given by authors. No detailed description of the eggs is given here, as that formed no part of the present study.



deposited in a nest in which the Yellow-head had three eggs and the latter laid no more eggs but incubated these four.

All the eggs of a set are colored alike but there is considerable variation in different sets. Occasionally the appearance in a nest of an egg differently marked from those already there, suggested the possibility of a female now and then laying an egg in a neighbor's nest.

In seventeen nests the period of incubation was completed; the eggs in nine nests in which the full complement was laid being destroyed before hatching. In these seventeen nests the period of incubation, inclusive of the day on which the last egg was laid, to the day on which the first egg hatched, was nine days in one instance, ten days in twelve, eleven days in three, and twelve days in one. Thus ten days may be considered the usual period of incubation. The nine day period was in the case of the only set of five eggs that hatched.

In the seventeen nests in which incubation was completed all the eggs hatched on the same day in only three nests; in three nests one egg hatched each day; in two nests two eggs hatched the first day and one egg each day thereafter; in four nests the eggs hatched irregularly during three days; in two nests the four eggs in each hatched during two days; in the set of five eggs one egg hatched each day for three days, the remaining two on the fourth day. In one instance it was two days after the first egg hatched before the second hatched, this in a nest containing three eggs, one of which was infertile. In each of three nests there was one infertile egg. This irregularity in the time of hatching of the eggs is perhaps due to individual variation in the time of beginning incubation, or faithfulness to the duties of incubation on the part of different birds.

A brief résumé of the foregoing exhibits the following facts in regard to the nidification of the Yellow-headed Blackbird:

The nesting period in southern Minnesota is from the middle of May to the latter part of June.

The female builds the nest and incubates the eggs without any assistance from the male.

The male assists in the care of the young, but only to a limited extent.

The body of the nest is constructed of wet material, the drying and contracting of which fixes it securely in position.

Among a number of birds there is a remarkable variation displayed in the nest-building ability, some individuals showing such defective instinct in the selection of nesting sites and such a lack of skill in workmanship that they are almost unable to construct serviceable nests.

The usual full complement of eggs is four, sometimes three or five.

The usual period of incubation is ten days.

The eggs of a set rarely all hatch at the same time, usually a period of two to four days being consumed.

The study of this colony of Yellow-headed Blackbirds met with early interference and later was prematurely terminated by an annoying and unexpected series of events, a brief account of which may be of some interest. Very early in the work it became evident that eggs were disappearing from the nests and between this time and the termination of the inspection June 13 every nest in the colony, except one, was emptied of its contents — eggs and newly hatched young — by some marauder or marauders, the identity of which could not be determined. The one unrifled nest contained, June 13, four nestlings several days old and one infertile egg. Assuming that these were also destroyed, which is almost a certainty, there was not a single young bird reared by this colony of Yellow-heads and all the season's effort went for naught. In all, seventy-seven eggs and fifty-three young birds were taken. Nineteen of the thirty-six nests in which eggs were laid were emptied of their contents before the full quota of eggs had been deposited. Sometimes the eggs and young disappeared one or two at a time, more commonly the nest was completely emptied between one visit and the next. Usually the nests were not soiled or disarranged in any way. In a few instances there were pieces of egg shells clinging to the reeds or lying in the water below the nests, and once or twice blood stains on the inside or rim of the nest. In one nest there remained two tiny feet and some pieces of flesh, and in another nest four feet, showing that in these instances at least the young birds were dismembered and devoured piecemeal. Once the dead body of a nestling that had fallen from the nest and been drowned in the water below, disappeared during the same night that its fellows in the nest above were disposed of.

Watch and examine as closely as we could we were unable to

determine what animal or animals it was that devoured these eggs and birds. Presumably some small carnivorous mammal that mounted the reed stalks from the water below, too nimble footed and light bodied to leave any traces of its presence beyond the despoiling of the contents of the nest. A pair of Least Bitterns established themselves in the midst of the Yellow-head colony, building their nest and laying their eggs, and from the unceasing animosity displayed toward them by the Blackbirds, suspicion fell on these birds. One of them was shot and its stomach examined but it contained no traces of eggs or young birds. The dismemberment of the nestlings would also seem to exonerate the Bitterns for they would certainly have swallowed them whole. The mystery remained unsolved and I leave it for the speculation of those who may be interested. It is but another of those tragedies constantly occurring which seem to show how natural agencies operate to destroy in great numbers birds and other animals, the too great increase of which would seriously disturb the natural balance of things.

TRANSCRIPT OF NOTES MADE DURING A DETAILED STUDY  
OF A BREEDING COLONY OF YELLOW-HEADED BLACK-  
BIRDS NEAR MINNEAPOLIS, MINN., IN 1901.

NEST I. *May 13th.* Completed, including lining; entirely dry. *14th.* Empty; pair keep close by. *15th to 17th inclusive.* Empty. *18th.* One egg. *19th.* Two eggs. *20th.* Three eggs. *21st.* Four eggs. *22nd to 30th inclusive.* Four eggs. *31st.* One young bird and three eggs. *June 1st.* Two young birds and two eggs. *2d.* Three young birds and one egg. *3d.* Four young birds. *4th.* Four young birds, pin-feathers showing plainly on two of them. *5th.* Four young birds. *6th.* Not visited, severe wind-storm. *7th.* Nest blown loose and fallen partly over; one young bird dead in water below nest; other three have pin-feathers one inch long. *8th.* Empty; all three young birds gone, and also the one that was drowned under the nest yesterday.

NEST II. *May 13th.* Just begun; a few strands; no shape or outline. *14th.* Only one or two additional pieces added — these still wet. *15th.* First attempt abandoned and have begun new nest since yesterday eight inches above beginnings of first one. A loosely constructed affair of finer and dryer material than usual; about one-half of walls built; a few broad leaves already in place but nest frail and not at all firmly placed. *16th.* Not visited. *17th.* Much larger and firmer; now a bulky nest; upper two inches and inside just added, very wet; two strips of broad dry lining

in place. 18th. Empty; a little wet material still being added to rim in places; fine lining being put in. Female makes great ado, much worried and utters rolling, squeaking and croaking notes. 19th. Empty. 20th. One egg. 21st. Two eggs. 22d. Three eggs. 23d. Four eggs, one much lighter than others. 24th to June 3d inclusive. Four eggs. June 4th. Three young birds and one egg. 5th. Four young birds. 6th. Not visited. 7th and 8th. Four young birds. 9th. Empty; nest pulled somewhat loose from fastenings.

NEST III. May 13th. Female working on nest. 14th. Walls incomplete; nearly dry; shallow and appears abandoned; no fresh material. 15th and 17th. Same condition. 18th. One or two damp strands lying on nest but no repairs. 19th to 21st. Abandoned and in ruin.

NEST IV. May 14th. Nearly ready for lining; still building upper part of walls; upper one-third wet; a few large flat pieces of reed leaves forming bottom inside as though for foundation of lining. 15th. About same in morning; at 6 P. M. a few wet strips added to rim on west side, woven around stems and hanging down into nest almost to bottom. 16th. Not visited. 17th. Appears deserted. 18th. Abandoned and going to ruin. 21st. Same.

NEST V. May 14th. Ready for lining, a little of which has been placed; wet nearly throughout, but this nest is among thickly standing reeds so that it is protected from sun and wind and would not dry as rapidly as more exposed nests. 15th. Completely lined, fine reed-tops around upper edge; nest still damp and soggy but lining dry. 16th. Not visited. 17th. Empty; dry and firm. 18th. Empty; in good condition; female close by with bit of reed in bill. 19th. One egg; fine lining at rim has been added since yesterday. 20th. Two eggs. 21st. Three eggs. 22d. Four eggs. 23d to 31st inclusive. Four eggs. June 1st. One young bird, three eggs. 2d. Three young birds, one egg. 3d. Three young birds, one egg. 4th. Three young birds, one egg; pin-feathers starting on one bird. 5th. Three young birds, one egg. 6th. Not visited. 7th. Empty; no soiling or disarrangement of nest.

NEST VI. May 14th. Still in early stage of construction, little more than framework; wall open to bottom on two sides, built up about three-fourths way around. 15th. Wall completed and first coarse bottom-lining and one or two strands of fine lining placed; female in nest when approached. 16th. Not visited. 17th. Completed and quite dry around top; body still damp and soft. A nicely lined nest, the edge thick and well built of reed-plumes. 18th. One egg. 19th. Two eggs. 20th. Three eggs. 21st. Four eggs, female on nest. 22d to 30th inclusive. Four eggs; female found on nest 27th and 30th. 31st. Two young birds and two eggs; female on nest. June 1st. Three young birds and one egg. 2d. Four young birds; female on nest; she made a great hue and cry and called the neighbors around till the reeds were full of them — mostly females. 3d. Four young birds. 4th. Empty; inside of nest spotted with blood.

NEST VII. *May 14th.* Nearly ready for lining, a little coarse material already placed. *15th.* Coarse lining all in, no fine top-lining. *16th.* Not visited. *17th.* Empty, in good condition. *18th.* One egg. *19th.* Two eggs. *20th.* Three eggs; coarse lining much disarranged and partly covering eggs. *21st.* Four eggs. *22d.* Four eggs. *23d.* Five eggs. *24th.* Four eggs; nest loosened from its hold on reeds and has slipped down about two feet, now within one foot of water, which is six inches deep; scattered strands left hanging all up and down reeds where nest had slipped. *25th.* Four eggs; nest torn and frayed out on one side. *26th.* Four eggs, warm. *27th to 31st inclusive.* Four eggs. *June 1st.* Two young birds, two eggs. *2d.* Three young birds, one egg. *3d.* Empty; nest clean.

NEST VIII. *May 14th.* Completed; still wet at top in places, protected from sun and wind by thick reeds. *15th.* Empty. *16th.* Not visited. *17th.* Empty, bottom lining a little disarranged. *18th.* Empty, more disarranged. *19th to 21st.* Abandoned.

NEST IX. *May 14th.* Completed and entirely dry, exposed to sun and air. *15th.* Empty; adding fine lining around rim. *16th.* Not visited. *17th.* Empty. *18th to 21st.* Abandoned.

NEST X. *May 14th.* Body finished but still wet nearly throughout owing to protection from sun and wind; large pieces of reed leaves forming bottom of lining already in; first strands of fine lining just placed. *15th.* About complete, still damp and soft. *16th.* Not visited. *17th.* One egg; nest dry and firm. *18th.* One egg. *19th.* Two eggs. *20th.* Three eggs. *21st.* Four eggs. *22d.* Five eggs. *23d to 30th inclusive.* Five eggs. *31st.* One egg hatched. *June 1st.* Two eggs hatched. *2d.* Three eggs hatched. *3d.* Five eggs hatched. *4th.* Empty, except two feet of young birds and several small pieces of flesh left in nest.

NEST XI. *May 14th.* Ready for lining; one wide dry leaf in place; upper part of sides and interior of nest still wet. *15th.* Coarse lining nearly complete, no fine lining; a very large and deep nest. *16th.* Not visited. *17th.* Same as on 15th.; no fine lining. *18th.* Empty, no fine lining at rim. *19th.* One egg. *20th.* Two eggs. *21st.* Three eggs. *22d.* Four eggs. *23d to 31st inclusive.* Four eggs. *June 1st.* One young bird, three eggs. *2d.* Three young birds, one egg. *3d.* Four young birds. *4th.* Four young birds; pin-feathers just starting on two of them. *5th.* Four young birds; pin-feathers on two about one-half inch long. *6th.* Not visited. *7th.* Four young birds; pin-feathers one inch long on three and one-half inch long on the fourth. *8th.* Four young birds; tips of brown feathers beginning to show, giving a general brownish hue to the nestlings. *9th.* Empty; blood on inside of nest.

NEST XII. *May 14th.* A completed and entirely dry nest; bottom lining of large pieces of reed-leaves three-fourths inch wide. *15th.* Lining torn out and disarranged; some of the fine reed-tops and broad bottom lining lying across top of nest. *17th.* Badly disarranged and plainly deserted.



NEST XIII. *May 14th.* Upper sides being built, nest wet and soggy throughout; sides incomplete and with holes; a few pieces of wide reed-leaves (dry) already in bottom. *15th.* Coarse lining complete, very little fine lining; nest at this stage not contracted at rim. *16th.* Not visited. *17th.* Empty; in good condition. *18th.* Missed. *19th.* Two eggs. *20th.* Three eggs. *21st.* Four eggs. *22d to 30th inclusive.* Four eggs. *31st.* One young bird, three eggs. *June 1st.* Three young birds, one egg. *2d.* Four young birds. *3d.* Four young birds. *4th.* Four young birds; one downy, one with pin-feathers just starting, one with pin-feathers about one-fourth inch long and the other with pin-feathers about one-half inch long. *5th.* Four young birds. *6th.* Not visited, severe storm. *7th.* Nest evidently blown loose in high wind yesterday; it slipped down about six inches and turned over so that all four young birds fell out; they were all in the water under the nest, dead, evidently drowned; not killed by any animal; later they disappeared.

NEST XIV. *May 14th.* Framework nearly complete, wet throughout; no dry leaves inside; upper edge of walls incomplete. *15th.* Walls complete and part of coarse lining placed; two pieces of latter lying across top of nest ready to be placed in position. *16th.* Not visited. *17th.* Complete and dry; a pretty nest. *18th.* Same. *19th.* One egg. *20th.* Two eggs. *21st.* Three eggs. *22d.* Four eggs. *23d to 31st inclusive.* Four eggs. *June 1st.* One young bird, three eggs. *2d.* Three young birds, one egg. *3d, 4th and 5th.* Four young birds. *6th.* Not visited. *7th.* Empty; four feet of young birds left in nest.

NEST XV. *May 14th.* Ready for lining; black, wet and soggy throughout. *15th.* Part of coarse, and few strands of fine, lining placed; drying out and much lighter colored; this nest was built of very wet and black material so that it was at first very conspicuous. *16th.* Not visited. *17th.* Dry and light colored. *18th.* Empty; two snails in bottom of nest. *19th.* One egg. *20th.* Two eggs. *21st.* Three eggs. *22d to 31st inclusive.* Three eggs. *June 1st.* One young bird, two eggs. *2d.* Three young birds. *3d.* Three young birds. *4th.* Empty; blood spots on inside of nest.

NEST XVI. *May 14th.* Finished; well lined; still wet in walls and bottom and soft on pressure. *15th.* Empty; becoming dry; no coarse broad reed leaves in bottom lining as usual, strips of fine grass instead. *16th.* Not visited. *17th.* Same as on 15th. *18th.* One egg. *19th.* Two eggs. Several large pieces of reed-tops form a fringe three inches high on one side of the nest due to their being loosely woven in the rim, the fine plumes waving in the breeze and forming a sort of one-sided bower; the fine lining otherwise closely placed as usual. *20th.* Three eggs. *21st.* Four eggs. *22d.* Five eggs. *23d.* Five eggs. *24th.* Empty, no sign of eggs; nest is one and one-half feet above water.

NEST XVII. *May 14th.* A large nest; bottom lining in; hole in one side; dry inside and below, still wet throughout walls; no fine lining. *15th.* Apparently entirely completed. *16th.* Not visited. *17th.*



Empty; dry; very little coarse lining, fine lining throughout bottom as well as sides and rim. 18th. Empty; good condition. 19th. One egg. 20th. Two eggs. 21st. Three eggs. 22d. Three eggs. 23d. Three eggs. 24th. Empty, no sign of eggs; nest about two feet above water, latter only few inches deep.

NEST XVIII. *May 14th.* Completed, ready for fine lining; coarse lining mostly in; soft and soggy on pressure. 15th. Fine lining about complete; dryer and fairly firm. 18th. One egg. 19th. Two eggs. 20th. Three eggs. 21st. Four eggs. 22d. Four eggs. 23d. Four eggs. 24th. Empty; no sign of eggs; nest about two feet above water, latter about one and one-half feet deep.

NEST XIX. *May 14th.* Only first strands laid. 15th. Foundation and one and one-half inches of walls built, forming a broad shallow cup. 17th. Completed and all of broad lining in place, extending to rim; no fine lining; still a little damp and soft. 18th. Empty; dry; a very little fine lining. 19th. Empty. 20th. One egg. 21st. Two eggs; these eggs are very unlike in appearance, representing extremes; one has a dirty white ground color with lilac and umber spots, the other pale green ground with less numerous spots giving it a general greenish tone. 22d to 24th inclusive. Two eggs. 25th. One egg, no sign of other. 26th. One egg. 27th. One egg; cold.

NEST XX. *May 14th.* Walls nearly finished but still full of holes; no coarse lining yet; rim of nest unformed; wet. 15th. Complete except finer lining; fairly dry but still little soft. 17th. Complete and dry except lacks usual fine lining at rim, strips of reed-leaves taking its place. 18th. Empty. 19th. One egg. 20th. Two eggs. 21st. Three eggs. 22d. Four eggs. 23d to 29th inclusive. Four eggs. 30th. Three eggs, no sign of fourth. 31st. Three eggs, warm. *June 1st.* Three eggs, warm. 2d. One young bird, two eggs. 3d. One young bird, two eggs. 4th. Two young birds, one egg; no pin-feathers showing on young birds. 5th. Two young birds, one egg; pin-feathers just starting on one young bird. 6th. Not visited. 7th. Two young birds, one egg; pin-feathers on one nestling about one half inch long, other still downy. 8th. Two young birds, one egg. 9th. Empty.

NEST XXI. *May 15th.* Ragged first part of framework; has been built since yesterday as it is near marked nest and was not then seen; all material very wet and apparently just placed. 16th. Not visited. 17th to 21st. No further work; evidently abandoned.

NEST XXII. *May 15th.* Completed and dry nest; evidently missed on 14th; perhaps lining not quite finished, very little fine top material. On returning two hours later the lining in nest had been much torn up and disarranged, the broad bottom strips lying across entrance to nest. Two hours later lining only little disarranged. 16th. Not visited. 17th. Completed and in good condition; dry and firm. 18th. Empty. 19th. One egg. 20th. Missed. 21st. Three eggs. 22d. Four eggs. 23d to 31st inclusive. Four eggs. *June 1st.* One young bird, three eggs.

2d. Two young birds, two eggs. 3d. Empty; both young birds and both unhatched eggs gone, no trace of either.

NEST XXIII. *May 15th.* Completed and dry nest; an abandoned attempt at a nest, consisting only of foundation, eight inches below bottom of this nest. 16th. Not visited. 17th. Empty; appears abandoned. 18th. Empty; lining all pulled out. 19th to 21st. Empty; evidently abandoned.

NEST XXIV. *May 15th.* Beginnings of a nest; damp but appears deserted. 16th. Not visited. 17th. Not much further work, only one damp strand apparently recently placed. 18th. Missed. 19th. Walls as to height about completed but full of holes, two of the latter are large open spaces; top and all of inside freshly laid and wet; a ragged, crude nest. 20th. Still adding new material to walls, wet and dark colored; dry nearly to rim outside; a few pieces of broad lining. 21st. Broad lining complete; no fine rim lining; quite dry. 22d. Same. 23d. One egg. 24th. Two eggs. 25th. Two eggs. 26th. Three eggs. 27th. Three eggs. 28th. Not visited. 29th. Empty, no sign of eggs; nest not soiled nor torn; two and one-half feet above water which is very shallow. 30th to June 3d. Empty.

NEST XXV. *May 15th.* Nearly completed framework but still full of holes and upper edge still ragged and unfinished; wet. This nest is in an open place and could not have been overlooked yesterday; apparently it has been built thus far in last twenty-four hours. Female after working all day, began about 5.15 p. m. to pull nest to pieces and begin a new nest about fifteen feet away, using at first the old material. 16th. Not visited. 17th to 21st. Abandoned; very little material removed.

NEST XXVI. *May 15th.* 6 p. m. First few strands of a new nest, not more than six or eight pieces; nearly dry, just removed from nest No. XXV which the female is pulling to pieces and removing to this place fifteen feet away. 16th. Not visited. 17th. A large bulky deep body, walls full height but still full of holes; wet except the strands at bottom. 18th. Abandoned after being almost ready for lining. 19th. Same; no further work; a loose poor structure. Nests III, XXV, XXVI and XLIV were built by the same bird and abandoned at various stages; all badly and loosely constructed; all near together. (See nest XLIII which was her finished product).

NEST XXVII. *May 15th.* First strands of nest; dry and perhaps abandoned. 17th. No further work; abandoned.

NEST XXVIII. *May 15th.* First dozen strands of a nest; dry material; tying crossing reeds together; probably abandoned attempt. 16th. Not visited. 17th. The above attempt was abandoned and to-day there is a bulky well built nest directly over it at a distance of twelve inches; walls complete and first strands of broad and fine lining being placed at same time; walls very wet and soggy and dark colored. These birds, both male and female, show much more concern than usual, both flying and perching about and croaking in a worried manner. 18th. Completed



YELLOW-HEADED BLACKBIRD STUDIES.

Upper figure, a nest in course of construction, still wet and soggy, and exhibiting unskilled workmanship.

Lower figure, nest VII; loosened from its hold on the reeds and slipped down two feet, leaving scattered strands hanging in its descent; not abandoned.







YELLOW-HEADED BLACKBIRD STUDIES.

Four stages in the construction of the nest.